

This DATASETreadme file was generated on 2022-01-13 by Stefan Karlsson

## GENERAL INFORMATION

1. Title of Dataset: Dataset: Indentation mechanical properties of chemically strengthened TiO<sub>2</sub> doped soda lime silicate glass.

### 2. Author Information

#### A. Principal Investigator Contact Information

Name: Stefan Karlsson

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3. Date of data collection: 2019-01-01 to 2021-03-01

4. Geographic location of data collection: Växjö (Sweden)

5. Information about funding sources that supported the collection of the data: FORMAS, the Swedish Research Council for Sustainable Development, Grant No. 2018-00707.

## SHARING/ACCESS INFORMATION

1. Licenses/restrictions placed on the data: Creative Commons Attribution License (CC BY)

2. Links to publications that cite or use the data:

Karlsson, S., *Compositional Effects on Indentation Mechanical Properties of Chemically Strengthened TiO<sub>2</sub>-Doped Soda Lime Silicate Glasses*. *Materials*, 2022. **15**(2): p. 577. DOI: <https://doi.org/10.3390/ma15020577>.

3. Links to other publicly accessible locations of the data: N/A

4. Links/relationships to ancillary data sets: N/A

5. Was data derived from another source? N/A

6. Recommended citation for this dataset:

Karlsson, S., Dataset: Indentation mechanical properties of chemically strengthened TiO<sub>2</sub> doped soda lime silicate glass, 2021, DOI: <https://doi.org/10.5878/2rze-dy74>

## DATA & FILE OVERVIEW

1. File List:

Nanoindentation: NHT\_Ti\_REF.pdf and NHT\_Ti\_CS.pdf

Crack Resistance: CR\_Ti\_CS.pdf

2. Relationship between files, if important: Data in NHT\_Ti\_REF.pdf and NHT\_Ti\_CS.pdf are the exact same glasses but before and after ion exchange treatment in molten salt bath. Please find detailed information in the scientific publication: Karlsson, S., *Compositional Effects on Indentation Mechanical Properties of Chemically Strengthened TiO<sub>2</sub>-Doped Soda Lime Silicate Glasses*. *Materials*, 2022. **15**(2): p. 577. DOI: <https://doi.org/10.3390/ma15020577>.

3. Additional related data collected that was not included in the current data package are given in the scientific publication: Karlsson, S., *Compositional Effects on Indentation Mechanical Properties of Chemically Strengthened TiO<sub>2</sub>-Doped Soda Lime Silicate Glasses*. *Materials*, 2022. **15**(2): p. 577. DOI: <https://doi.org/10.3390/ma15020577>.

4. Are there multiple versions of the dataset? No

#### METHODOLOGICAL INFORMATION

1. Description of methods used for collection/generation of data:

Please find all relevant information in the following scientific paper:

Karlsson, S., *Compositional Effects on Indentation Mechanical Properties of Chemically Strengthened TiO<sub>2</sub>-Doped Soda Lime Silicate Glasses*. *Materials*, 2022. **15**(2): p. 577. DOI: <https://doi.org/10.3390/ma15020577>.

2. Methods for processing the data:

Please find all relevant information in the following scientific paper:

Karlsson, S., *Compositional Effects on Indentation Mechanical Properties of Chemically Strengthened TiO<sub>2</sub>-Doped Soda Lime Silicate Glasses*. *Materials*, 2022. **15**(2): p. 577. DOI: <https://doi.org/10.3390/ma15020577>.

3. Instrument- or software-specific information needed to interpret the data: N/A

4. Standards and calibration information, if appropriate:

Indenter tip was calibrated using standard samples provided by ST Instruments. For nanoindenter, fused silica was used and for microindenter BK7 was used.

5. Environmental/experimental conditions:

Please find all relevant information in the following scientific paper:

Karlsson, S., *Compositional Effects on Indentation Mechanical Properties of Chemically Strengthened TiO<sub>2</sub>-Doped Soda Lime Silicate Glasses*. *Materials*, 2022. **15**(2): p. 577. DOI: <https://doi.org/10.3390/ma15020577>.

6. Describe any quality-assurance procedures performed on the data:

Please find all relevant information in the following scientific paper:

Karlsson, S., *Compositional Effects on Indentation Mechanical Properties of Chemically Strengthened TiO<sub>2</sub>-Doped Soda Lime Silicate Glasses*. *Materials*, 2022. **15**(2): p. 577. DOI: <https://doi.org/10.3390/ma15020577>.

7. People involved with sample collection, processing, analysis and/or submission:

A. Stefan Karlsson

#### DATA-SPECIFIC INFORMATION FOR Nanoindentation: NHT\_Ti\_REF.pdf

1. Number of variables: 8 for each sample incl. standard deviation (Std Dev) for all data.

2. Number of cases/rows:

8 for each sample

3. Variable List:

No. = number of selected indentations from the collected indentations.

HIT (O&P) = Indentation Hardness by Oliver and Pharr method in MPa.

EIT (O&P) = Indentation Elastic Modulus by Oliver and Pharr method in GPa.

E\* (O&P) = Indentation Elastic Modulus by Oliver and Pharr method in GPa.  
Er (O&P) = Reduced Elastic Modulus by Oliver and Pharr method in GPa.  
hm = Maximum contact depth in nm by Oliver and Pharr method.  
Fm = Force by Oliver and Pharr method.  
m = Strain-rate sensitivity by Oliver and Pharr method.

#### 4. Missing data codes:

Key code for identifying sample in relation to the publication: Karlsson, S., Compositional effects on indentation mechanical properties of chemically strengthened TiO<sub>2</sub> doped soda lime silicate glass, Materials.

Ti11 = 1.1  
Ti12 = 1.2  
Ti13 = 1.3  
Ti14 = 1.4  
Ti22 = 2.2  
Ti23 = 2.3  
Ti24 = 2.4  
Ti25 = 2.5  
Ti26 = 2.6  
Ti27 = 2.7  
Ti32 = 3.2  
Ti33 = 3.3  
Ti34 = 3.4  
Ti35 = 3.5  
Ti36 = 3.6  
Ti37 = 3.7

#### 5. Specialized formats or other abbreviations used: N/A

DATA-SPECIFIC INFORMATION FOR Nanoindentation: NHT\_Ti\_CS.pdf

1. Number of variables: 8 for each sample incl. standard deviation (Std Dev) for all data.

2. Number of cases/rows:

8 for each sample

3. Variable List:

No. = number of selected indentations from the collected indentations.

HIT (O&P) = Indentation Hardness by Oliver and Pharr method in MPa.

EIT (O&P) = Indentation Elastic Modulus by Oliver and Pharr method in GPa.

E\* (O&P) = Indentation Elastic Modulus by Oliver and Pharr method in GPa.

Er (O&P) = Reduced Elastic Modulus by Oliver and Pharr method in GPa.

hm = Maximum contact depth in nm by Oliver and Pharr method.

Fm = Force by Oliver and Pharr method.

m = Strain-rate sensitivity by Oliver and Pharr method.

#### 4. Missing data codes:

Key code for identifying sample in relation to the publication: Karlsson, S., Compositional effects on indentation mechanical properties of chemically strengthened TiO<sub>2</sub> doped soda lime silicate glass, Materials.

Ti11-CS = 1.1-CS

Ti12-CS = 1.2-CS

Ti13-CS = 1.3-CS  
Ti14-CS = 1.4-CS  
Ti22-CS = 2.2-CS  
Ti23-CS = 2.3-CS  
Ti24-CS = 2.4-CS  
Ti25-CS = 2.5-CS  
Ti26-CS = 2.6-CS  
Ti27-CS = 2.7-CS  
Ti32-CS = 3.2-CS  
Ti33-CS = 3.3-CS  
Ti34-CS = 3.4-CS  
Ti35-CS = 3.5-CS  
Ti36-CS = 3.6-CS  
Ti37-CS = 3.7-CS

5. Specialized formats or other abbreviations used: N/A

DATA-SPECIFIC INFORMATION FOR Crack Resistance: CR\_Ti\_CS.pdf

1. Number of variables: 4 for each sample for all data.

2. Number of cases/rows: 4 columns for each sample

3. Variable List:

Load in N

Amount of radial cracks

Percentage of Crack Initiation in %

Standard Deviation

4. Missing data codes: N/A

Key code for identifying sample in relation to the publication: Karlsson, S., Compositional effects on indentation mechanical properties of chemically strengthened TiO<sub>2</sub> doped soda lime silicate glass, Materials.

5. Specialized formats or other abbreviations used: N/A